



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,283	04/11/2006	Kazumi Fujimoto	NNA-108-B	9454
48980	7590	12/28/2009		
YOUNG BASILE 3001 WEST BIG BEAVER ROAD SUITE 624 TROY, MI 48084			EXAMINER BITAR, NANCY	
			ART UNIT 2624	PAPER NUMBER
			NOTIFICATION DATE 12/28/2009	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@youngbasile.com
audit@youngbasile.com

Office Action Summary

Application No.

10/575,283

Applicant(s)

FUJIMOTO, KAZUMI

Examiner

NANCY BITAR

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Response to Arguments

1. Applicant's response to the last Office Action, filed 6/29/2009, has been entered and made of record.
2. Applicant has amended claims 1-5,9-11,13-15,18-20,22,23,25,26,28 and 28. Claims 1-30 are currently pending.
3. Applicant's arguments, in the amendment filed 9/28/2009, with respect to the rejections of claims 1-30 under 35 U.S.C. 103(a) have been fully considered but are moot in view of the new ground(s) of rejection necessitated by the amendments. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Shimakage et al (US 7,091,838)

Examiner Notes

4. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al (US 6,466,684) in view of Shimakage et al (US 7,091,838)

As to claims 1 and 2, Sasaki et al teaches an apparatus for detecting objects in one or more images captured by an image pickup device mounted on a vehicle (image pick up 21, figure 2), comprising: memory (image processing,22, figure 2) on which is stored pixels of at least one image captured by the image pickup device; and a controller (computation,23, figure 2)operatively coupled to the memory and adapted to compute velocity information for each pixel in an image; using a sequential series of images extract those pixels having a velocity component based on the velocity information wherein the velocity component comprises a movement direction and a movement velocity in a lateral direction; define region for detecting road boundary ; detect oblique lines based on grouping those extracted pixels having a velocity component in the regions ; and generate a signal indicative of a road boundary in the image based on the oblique lines (column 9 lines 1-15 and lines 51-64 and column 10, lines 50-57).Sasaki teaches the controller is further adapted to judge that oblique lines in the image are road boundaries when the vehicle is traveling and the oblique lines are positioned on the image with bilateral symmetry and different velocity directions (column 8, lines 6-11). Sasaki further discloses the detection of objects and generates a collision danger (column 16, lines 60-64,

column 17, lines 3-10). Sasaki discloses provides an alarm to the user (column 18, lines 29-37). While Sasaki meets a number of the limitations of the claimed invention, as pointed out more fully above, Sasaki fails to specifically teach computing velocity information for each pixel in the image wherein the velocity component comprises a movement direction and a movement velocity in a lateral direction and generates a signal indicative of road boundary in the image based on the oblique line. . Specifically Shimakage et al teaches A lane deviation alarm system is comprised of a forward-observed-point calculating section that calculates a forward observed point by multiplying a vehicle speed of a host vehicle and an anticipated deviation time; a forward-observed-point lateral-displacement calculating section that calculates a lateral displacement at the forward-observed-point, on the basis of a yaw angle and the forward-observed-point; a lane deviation tendency determining section that determines whether the host vehicle is in a lane deviation tendency, on the basis of the forward-observed-point lateral-displacement; and a criteria changing section that changes a criteria for determining a lane deviation tendency of the host vehicle, on the basis of a detecting condition of the lane defining line (see abstract; see also figure 7 and 8). Moreover, Shimakage teaches in figures 2-5 the controller 2 outputs a drive signal to an alarm device 7 to generate warning sound or displaying warning information so as to give a warning to the driver.

It would have been obvious to have compute the velocity information for each pixel and use the controller 2 of Shimakage with the controller of Sasaki when seeking a system that better avoid potential collisions , increase the accuracy of object recognition and an estimation error of the vehicle position relative to the traveling lane largely decrease thus avoiding

erroneous alarms. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 3, Sasaki et al teaches the apparatus of claim 1, wherein the controller is further adapted to judge that oblique lines in the image are road boundaries when the respective slopes of the oblique lines decrease from a center of the image toward the outside of the image (figure 3 and 4).

As to claim 4, Shimakage et al teaches the apparatus of claim 1, wherein the controller is further adapted to detect a change point where the velocity direction of a detected oblique line changes from one image to a subsequent image , and to judge that the change point as the pitching balance point where a line of sight orientation of the image pickup device is horizontal with respect to a road surface. (column 3 lines 25-column 4 lines 47).

As to claim 5, Shimakage et al teaches the apparatus of claim 1, wherein the controller is further adapted to identify moving object that is approaching the predicted path of the vehicle by grouping those extracted pixels having same velocity component with the movement direction being from a side toward the predicted path of the vehicle; and to generate a collision danger signal indicative of the risk of collision between the vehicle and the moving object (see abstract and claims 2-3 and figures 14A-14B)

As to claim 6, Sasaki et al teaches the apparatus of claim 5, wherein the controller is further adapted to transform into a real space road model the oblique lines judged as the road boundary and the moving object and to determine the risk of collision between the vehicle and the moving object based on the relative positional relationship between the road boundary and the moving object as established in the real space road model (converting the early image on the

basis of a predetermined optical arrangement of the image pick-up means onto an x-z plane in parallel to a road surface in a real space to acquire a road surface image; means for computing a moving distance of one's own vehicle between the two timings on the basis of a time interval between the two timings and speed information of one's own vehicle, column 9 lines 1-15 and 51-64; see also Shimakage column 3 lines 25-column 6 lines 31)

As to claim 7, Sasaki et al teaches the apparatus of claim 5, wherein the controller is further adapted to generate the collision danger signal at one of a plurality of values corresponding to collision risk levels (on the basis of the optical flow thus detected, the degree of danger ahead of the vehicle is evaluated (step S5). If it is decided dangerous, a warning signal for warning a driver is issued to a warning device 24 (step S6), See figure 3; see also controller 2 of Shimakage).

As to claim 8, Sasaki et al teaches the apparatus of claim 5, further comprising an audio alert operatively coupled to the controller and activated by the collision danger signal (The warning to the driver is carried out on the basis of the evaluation of the degree of danger in the processing in step S5. The arithmetic unit 23 in the environment monitoring system according to the present invention controls the warning device 24 in accordance with the degree of danger acquired in step S5 so that an alarm is sounded to call a driver's attention. In this way, this assists the limited recognition of a human being, thereby preventing a danger of a serious accident or the actual occurrence thereof, Column 16, lines 59-67; column 18, lines 29-45; see also Shimakage figure 2A ; alarm device 7 coupled to controller 2).

As to claim 9, Shimakage et al teaches the apparatus of claim 5 further comprising an automatic breaking device operatively coupled to the controller and activated by the collision danger signal (figure 19).

The limitation of claims 10-18 has been addressed in claims 1-9.

The limitation of claims 19-30 has been addressed above. Sasaki teaches providing a velocity information computing means, pixel extraction means, oblique line detecting means and boundary line detecting means (column 8, lines 6-11; column 9, lines 1-15 and 51-64 ; figures 3-4; see also Shimakage et al abstract; figure 2A,2B; figures 10,11 and 16)

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nancy Bitar/
Examiner, Art Unit 2624

/Wes Tucker/
Primary Examiner, Art Unit 2624